Progress of the Phase 7 Main Bay Model (MBM) and Multiple Tributary Models (MTMs)

CBP Modeling Quarterly Review

April 6, 2022

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Overview of the Main Bay Model (MBM) Workplan

- The MBM cooperative agreement runs for 6 years: 2022 to 2027.
- The MTMs have yet to be started.
- For both the MBM & MTM the CBP Modeling Workgroup gives technical direction and the WQGIT and other CBP decision-making groups will give management and policy direction to MBM practitioners.
- MBM and MTM development in five main phases:
 - Initial Development (2022 2023)
 - Interim Development (2023 2024)
 - Final Development (2025)
 - Review and Application (2026-2027)
 - Ongoing Tasks.



Overview of the Main Bay Model (MBM) & Multiple Tributary Model (MTM) Workplan: Initial Development Phase

Calendar Year		2022	2022		
Calendar Quarter		Q1	Q2 Q	3 Q4	
Project Year			Year 1		
Task 1. Initial MBM-MTM Development (2022 – 2023)	Task 1				
1-1. Kick-off MBM meeting, with follow-up CBPO Quarterly meetings (Q1-Q2: 2022).	Task 1.1				
1-2. Integrate the latest ICM changes into MBM (Q1-Q2: 2022).	Task 1.2				
1-3. Revise the current MBM mesh as needed to achieve best scale-performance tradeoffs (Q1-Q3: 2022).	Task 1.3				
1-4. Revise MBM mesh to account for channels in MBM and MTMs (Q1-Q2: 2022)	Task 1.4				
1-5. Performance tuning of MBM to achieve 1991-2000 simulation in one day (Q1-Q3: 2022).	Task 1.5				
1-6. Work with watershed, airshed, hydrological modeling group's inputs (All Qs: 2022-2023).	Task 1.6				
1-7. Develop boundaries of MBM, WSM, and tidal wetlands (Q1: 2022).	Task 1.7				
1-8. Quantify how boundaries of MBM, WSM, and tidal wetlands will change with SLR (Q2: 2022).	Task 1.8				
1-9. Develop SAV simulation approach: explicit beds or bounded seed in every mesh (All Qs: 2023).	Task 1.9				
1-10. Establish MBM-MTM boundary interfaces for all MTMs (All Qs:2022).	Task 1.10				
1-11. Develop MTM grids in anticipation of MTM teams (All Qs: 2022).	Task 1.11				
1-12. CBP decision makers to finalize 5 MTMs (Q2-Q3: 2022).	Task 1.12				
1-13. Link with initial P7 WSM hydrology (Q4: 2022, Q1: 2023).	Task 1.13				
1-14. Link with initial P7 WSM sediment load estimates (1Q-Q2: 2023).	Task 1.14				
1-15. Link with initial P7 WSM nutrient load estimates (3Q-Q4: 2023).	Task 1.15				
1-16. Expand temporal domain of MBM to focus on 1991-200 and other key years (All Qs: 2022-2023).	Task 1.16				
1-17. Initial work to improve shallow water dynamics in MBM (All Qs: 2022-2023).	Task 1.17				
1-18. Initial work to improve shallow water dynamics in MTMs (All Qs: 2023).	Task 1.18				
1-18. Initial work on basic living resource linkages of refined chlorophyll, wetlands, & SAV (All Qs: 2022-2023).	Task 1.19				



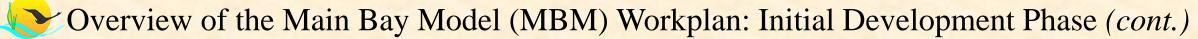
- 1-1. Kick-off MBM meeting with follow-up CBPO Quarterly meetings to decide tasks to be completed, priority model activities and improvements, and finalize the schedule for progress reporting (Q1-Q2: 2022). **Completed**
- 1-2. Integrate the latest ICM changes into MBM (Q1-Q2: 2022). Ongoing
- 1-3. Revise the current MBM mesh to achieve best scale and performance tradeoffs (Q1-Q2: 2022). **Ongoing**
- 1-4. Revise MBM mesh to account for channels in MBM and MTMs (Q1-Q2: 2022).
- 1-5. Performance tuning of MBM to achieve 1991-2000 simulation in one day (Q1-Q3: 2022). **Ongoing**
- 1-6. Work with watershed, airshed, hydrological modeling groups to ensure the coupling, scale, and the interface mechanisms are properly executed, including climate change (CC) input information (All Qs: 2022-2023). **Ongoing**



- 1-7. Develop boundaries of MBM, WSM, and tidal wetlands (Q1: 2022).

 Ongoing
- 1-8. Quantify how boundaries of MBM, WSM, and tidal wetlands will change with SLR (Q2: 2022). **Ongoing**
- 1-9. Develop SAV simulation approach of explicit beds or bounded seed in every mesh (All Qs: 2022-2023). **Ongoing**
- 1-10. Establish MBM-MTM boundary interfaces for all MTMs (All Qs:2022). **Ongoing**
- 1-11. Develop MTM grids in anticipation of MTM teams (All Qs: 2022).

 Ongoing



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- 1-12. CBP decision makers to finalize 5 MTMs (Q2-Q3: 2022).
- 1-13. Link with initial P7 WSM hydrology (4Q: 2022).
- 1-14. Link with initial P7 WSM sediment load estimates (1Q: 2023).
- 1-15. Link with initial P7 WSM nutrient load estimates (3Q: 2023).
- 1-16. Expand temporal domain of MBM to focus on 1991-200, 1993-1995, recent years for good calibration data, and the full 1985-present for coastal eutrophication research (All Qs: 2022-2023).
- 1-17. Initial work to improve shallow water dynamics in MBM (All Qs: 2022-2023). **Ongoing**

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- 1-18. Initial work to improve shallow water dynamics in MTMs (All Qs: 2023). **Ongoing**
- 1-18. Initial work on basic living resource linkages of refined chlorophyll, wetlands, & SAV MBM & MTM (All Qs: 2022). **Ongoing**
- 1-19. Initial work on potential linkage to higher trophic levels MBM & MTMs (All Qs: 2023).
- 1-20. Initial work of using MBM and MTMs to better resolve CBP problem segments (All Qs: 2023).
- 1-21. Initial work on examining CC influence on SAV, shallow water, and phenology of CC watershed loads and tidal Bay processing MBM & MTM (All Qs: 2023).



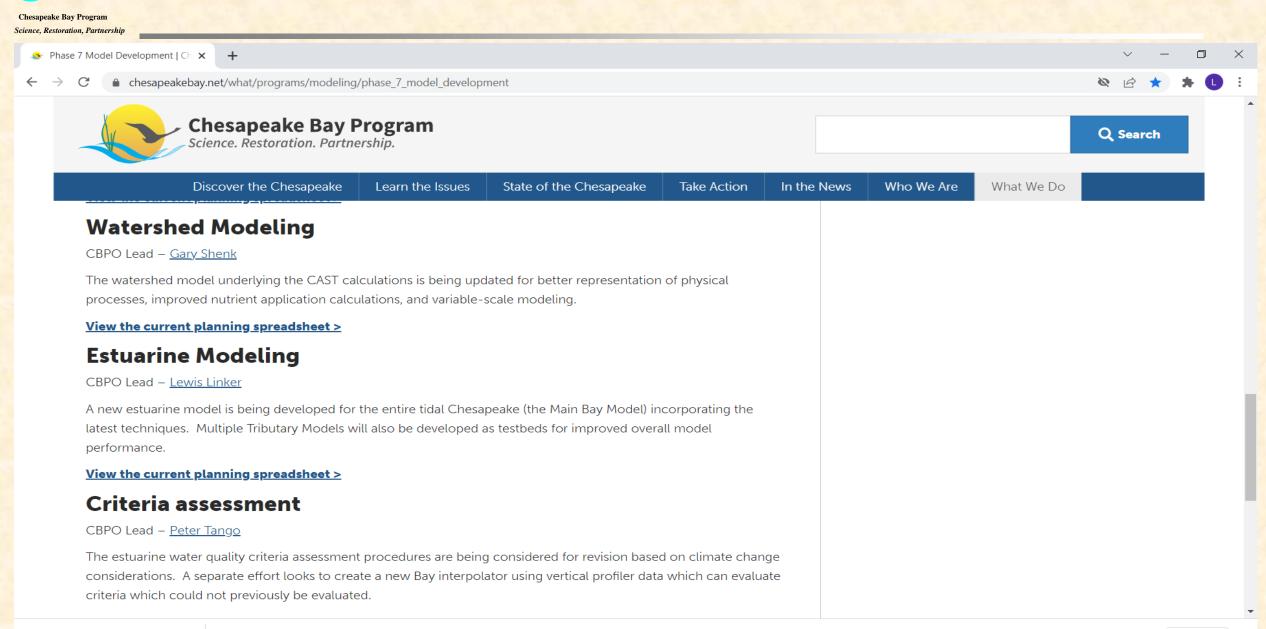
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MBM_Tasks__Time....xlsx ^

https://www.chesapeakebay.net/what/programs/modeling/phase_7_model_development



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